

## REMARKS

Claims 29, 47-61, and 63-75 are pending in the application. Claims 48-55, 58-60, 63, and 68-73 are withdrawn pursuant to restriction and election of species requirements. Claims 74 and 75 are new. No claims are presently allowed.

Claims 29, 68, 69, and 73 are amended to recite that the negative pressure source is configured to draw the at least one fluid at a predetermined flow rate and that the characteristic dimension of the primary fluid channel is dependent upon the flow rate. Support for this amendment is found at page 9, lines 9-14 and in the material added to the specification in the amendment of 02/27/2004.

Claims 74 and 75 recite that the at least one fluid comprises an aqueous fluid or a biological or chemical species. Support for this amendment is found at page 18, lines 4-7.

No new matter has been added .

## Claim Rejections – 35 U.S.C. § 103

Claim 29 has been rejected under 35 U.S.C § 103(a) as being allegedly unpatentable over Bolton (US 3,976,087). Applicant respectfully traverses.

The Examiner contends that it would have been obvious to add a vent to tank 20 of Bolton "in order to break the inherent vacuum of a sealed tank as taught with respect to tank 34." (Office Action, pg. 3, lines 6-8) However, the proposed modification would appear to destroy the intended utility of Bolton, and is therefore is improper for a rejection under section 103. (See MPEP 2143.01 ("If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.")).

Specifically, Bolton requires the pumping of water from tank 20 to create (via induction manifold 80) a vacuum to draw material from measuring tank 34 yet the Examiner's proposed valve would "break the inherent vacuum of the sealed tank." Indeed, the necessity of tank 20 being sealed for this the function of Bolton is well explained in the reference:

Water from storage tank 20 is pumped through conduit 76 and into the umbilical leading to the tractor spraying rig by pump 84 to extract and dilute the chemical mixture in measuring tank 34 and transfer it to spraying rig 14'. Valve 86 is open for this purpose. As the water is being pumped, induction manifold 80 will draw a

partial vacuum on conduit 44. Dump valve 46 is opened together with air vent 48 so that the concentrated liquid chemicals in measuring tank 34 are drawn through conduit 44 under a partial vacuum and entrained in the water flowing through conduit 76 and onto the tractor spraying rig.

(Bolton, col. 6, ll. 35-46 (emphasis added).) The MPEP discussion of *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) is particularly pertinent to the present rejection. In *Gordon*, as characterized in MPEP 2143.01, the “[c]laimed device was a blood filter assembly for use during medical procedures wherein both the inlet and outlet for the blood were located at the bottom end of the filter assembly, and wherein a gas vent was present at the top of the filter assembly. The prior art reference taught a liquid strainer for removing dirt and water from gasoline and other light oils wherein the inlet and outlet were at the top of the device, and wherein a pet-cock (stopcock) was located at the bottom of the device for periodically removing the collected dirt and water. The reference further taught that the separation is assisted by gravity. The Board concluded the claims were *prima facie* obvious, reasoning that it would have been obvious to turn the reference device upside down. The court reversed, finding that if the prior art device was turned upside down it would be inoperable for its intended purpose because the gasoline to be filtered would be trapped at the top, the water and heavier oils sought to be separated would flow out of the outlet instead of the purified gasoline, and the screen would become clogged.” MPEP 2143.01. Much like it was non-obvious in *Gordon* to invert the filter since this would destroy the reference’s disclosed reliance on gravity for operation, it seems equally non-obvious to defeat the intended operation of Bolton by venting water tank 20, thereby eliminating the vacuum disclosed to be necessary to Bolton.

In addition, it appears that, contrary to the proviso of claim 29, that water would indeed flow from water tank 20 to the so called primary flow channel (“a primary flow channel directly above [Bolton] pu[m]p 84” (Office Action, pg. 3, line ). At the very least, the Examiner has not shown a teaching (inherently or otherwise) of the limitation of the proviso of claim 29.

Claims 29, 47, and 61 have been rejected under 35 U.S.C § 103(a) as being allegedly unpatentable over Brody (US 5,726,404). Applicant respectfully traverses.

Principally, the reference fails to render obvious the present claims as it does not disclose the limitation in claim 29 that the primary fluid channel is configured to have a characteristic

dimension such that the selective fluid drawing at the flow rate is not a low Reynolds number fluid flow.

Further, as a point of clarification, the 131 Declaration of 12/07/2005 referenced in the Office Action only attests to the timing of the inventor's work. Contrary to what is stated in the Office Action, the Declaration does not "state[] that the characteristic dimension defining low Reynolds number flow for aqueous systems is 100 um" as claimed by the Examiner (Office Action, p. 3, lines 13-15). What the Examiner appears to be referring to is page 7 of the disclosure attached to the 131 Declaration, not the Declaration itself. The Declaration itself makes no representations regarding the Reynolds number.

In any event, the Examiner's reliance on 100 um as the characteristic dimension is taken out of context, as low / high Reynolds number is based on not only the channel dimension but the fluid viscosity and the flow rate. The present amendment clarifies that that the channel dimension is based on the flow rate generated by the negative pressure source for a given fluid. See, for example, the material added to the specification in the amendment of 02/27/2004 and section (2)(i) on page 7 of the Invention Disclosure attached to the Declaration.

Second, the entire basis of Brody is that it operates in the low Reynolds number regime and that this is distinct from macroscopic devices:

This invention provides a valveless method and apparatus for high speed switching of liquid flow between intersecting microchannels. Liquid flow is controlled by manipulating external driving pressures. The switch is simple to fabricate has no integral moving parts, does not require high voltages, and can be fabricated in a silicon wafer. The switch operates in the low Reynolds number regime where fluid dynamics are dominated by viscous forces rather than inertial forces. Because of this, the microswitch of the present invention is inherently different from macroscopic devices.

(Brody, col. II. 7-17 (emphasis added).) The configuration of this device, by choice of flow rate and fluid viscosity, for example, to operate in the high Reynolds number regime is therefore expressly taught away from. Moreover, given Brody's statement that because of its low Reynolds number design "the microswitch of the present invention is inherently different from macroscopic devices" there would be no reasonable expectation of success to configure the

device for operation outside the low Reynolds number regime. Indeed, the Examiner's proposed modification of Brody, such that it is configured for operation outside a low Reynolds number regimes, would render Brody unsuitable for its intended purpose, as discussed above.

Significantly, it is also improper for the Examiner to pick and choose a channel dimension divorced from the disclosure of Brody as a whole regarding low Reynolds number configuration. Thus, the Examiner is not free to arbitrarily combine a relatively larger channel dimension with a flow rate (which is not referenced in the Office Action) with a fluid viscosity (also not referenced in the Office Action) to achieve a device configured the opposite to Brody's low Reynolds number configuration.

Thus, not only is there no teaching of a configuration per the last 3 lines of claim 29, such a configuration is entirely inconsistent with and taught away from by Brody.

Claims 56 and 57 have been rejected under 35 U.S.C § 103(a) as being allegedly unpatentable over Brody and further in view of Heller et al. (US 5,849,486) or Feldstein et al. ("Fluorescence Array Biosensor Part 1: Optics and Fluidics").

The rejected claims depend from and contain all the limitations of claim 29. Neither Heller nor Feldstein overcomes the deficiencies of Brody. None of the references discloses the limitation that the primary fluid channel is configured to have a characteristic dimension such that the selective fluid drawing at the flow rate is not a low Reynolds number fluid flow

#### CONCLUSION

In view of the foregoing, it is submitted that the application is now in condition for allowance.

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Respectfully submitted,



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